JPL

March 5, 2001

Jet Propulsion Laboratory
California Institute of Technology
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Attention: All Prospective Proposers

Subject: Request for Proposal (RFP) No. JPL-MSR-2001 for the Mars Sample Return Technical Approach Study

Enclosed is the subject RFP for the Mars Sample Return Technical Approach Study. The Jet Propulsion Laboratory (JPL) cordially invites your organization to submit a proposal in conformance with the instructions contained herein.

The NASA Mars Exploration Program and its European partners are planning an integrated series of science and technology demonstration missions, culminating in the launch of MSR elements as early as 2011. Orbiter missions launching in 2001, 2005 and 2007 provide opportunities to select and characterize sample collection sites and to demonstrate capabilities which might be needed for MSR, such as Mars aerocapture and Mars orbit rendezvous. Lander missions launching in 2003 and 2007 can provide for demonstration of entry/descent/landing and surface mobility capabilities. Recent workshops have identified a broad spectrum of options for implementation of a MSR mission. The Mars Exploration Program now seeks to develop sufficient understanding of the feasibility and cost of these options (as well as other options that may arise during this study) such that priorities can be established in early 2002 for best use of the technology demonstration opportunities cited above.

The Mars Exploration Program and the Sample Return Mission are driven by science. Sample return will enable greater understanding of Mars than is otherwise possible with remote sensing and in situ investigations. Analyses of returned samples will address the program's goals in understanding whether life ever existed on Mars, the past and present climate, the interior and surface of the planet, and will characterize the Martian environment, particularly as it influences future human exploration. A "science baseline" has been established which requires that the total mass of samples returned by a first mission be greater than 500g; that returned samples include rock, soil and atmosphere; that sample diversity be assured by providing mobility for the sample selection and that collection payload of no less than 1 km;

and that the sample collection vehicle lands in a 50 km target zone. It is desired that the contractor assess options satisfying the science baseline and also options providing more or less aggressive science content. More aggressive content would include (1) survival of surface science assets after the sample has left the surface of Mars, extending in situ investigations to a total of at least two years and (2) extended mobility

beyond the 1 km sample return mobility requirement to at least beyond the perimeter of the landing uncertainty footprint. Less aggressive content would involve reduced mobility and/or landing accuracy.

This RFP is for a 6-month effort to include examination of a wide range of sample return technical approaches, in-depth exploration of a few approaches, identification of technology development priorities, and estimation of MSR life cycle cost. It is planned to award up to three (3) Fixed Price study contracts valued at $1,000,000 each. The contracts will be awarded via the JPL competitive source evaluation and source selection process. Potential offerors are strongly encouraged to form teams including academic and industrial partners.

The goal of this effort is to comprehensively explore innovative MSR technical approaches and to study their feasibility. This is required to establish a viable technical and programmatic implementation plan leading to sample return. We ask that a broad set of approaches be explored during the early part of this contract and then a single approach will be studied in further detail during the remaining duration of the contract. We wish to make it clear that these studies are not to be constrained by previous sample return concepts.

As a courtesy to JPL, you are requested to provide to the undersigned, no later than March 12, 2001, a written statement indicating whether or not your organization intends to submit a proposal. Should the choice be not to propose, please include a brief statement addressing the reasons for your decision not to propose.

All questions and correspondence related to this procurement shall be directed only to the undersigned.

Cordially,

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